Non-Traditional Shelter Case Studies

American Red Cross

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INTRODUCTION

Purpose

The purpose of this document is to capture pertinent information regarding the historical use of non-traditional sheltering. This compilation of information from previous disaster operations can be used to more effectively plan for and respond to future NTS operations. For the purpose of this document, the focus was on two NTS models:

1. Mega-shelters, which are large facilities (e.g., stadiums or conference centers) that can house large groups of evacuees.
2. Open space shelters, which are large outdoor environments (e.g., fairgrounds or parks) and use soft-sided or temporarily constructed structures.

Background

Emergency management agencies and jurisdictions are recognizing the need to plan for NTS operations as a result of their historical use following catastrophic incidents when the capacity of traditional congregate shelters is exceeded.

Five disaster responses, during which at least one NTS was opened, were reviewed:

1. Northridge Earthquake (1994)
2. Hurricane Katrina (2005)
3. California Wildfires (2007)
4. Hurricane Ike (2008)
5. American Samoa Earthquake and Tsunami (2009)

Key observations, in the form of documentation and personal interviews, were collected from the NTS operations of each disaster response and compiled as case studies. The documents consisted of narratives, After-Action Reports (AAR), and evaluations. The interviews were conducted with disaster relief staff that served in on-site leadership roles or were part of the support structure.

Key observations from each case study have been placed under several themes within this document. While several of the key observations could be placed under multiple categories, they were grouped under the most dominant theme. All five case studies focus on domestic responses and further information can be obtained from the American Red Cross Los Angeles Region.[1]

[1] For contact information, visit www.redcrossla.org

NON-TRADITIONAL SHELTER SUMMARY

Table 1 below lists the disaster/case study and the NTS model(s) used in the disaster response.

Table 1: NTS Models Employed in Previous Disasters

Disaster Incident/Event	NTS Model(s) Employed
Northridge Earthquake	1. Spontaneous open space shelter initiated by the disaster-affected population 2. Open space shelter initiated by government
Hurricane Katrina	1. Mega-shelter: Reliant Park, Houston
California Wildfires	1. Spontaneous open space shelter initiated by the disaster-affected population 2. Mega-shelter: Qualcomm Stadium, San Diego 3. Mega-Shelter: National Orange Show Fairgrounds, San Bernardino
Hurricane Ike	1. Mega-shelter: Houston former retail space 2. Open space shelter Galveston Island
American Samoa Earthquake & Tsunami	1. Open space shelter resources provided to the disaster-affected population 2. Open space staff shelter

CASE STUDIES

A. Northridge Earthquake

Quick Facts: Northridge Earthquake[2]	
Location	Epicenter located in Reseda, CA
Date	January 17, 1994
Time	4:30am local time
Incident/Event Details	Magnitude 6.7 earthquake
NTS Model Used	1. Open space shelters: a. Various parks; 20,000 evacuees b. Los Angeles, North Hollywood, and the San Fernando Valley c. Reseda Park used by evacuees with their own tents

Overview of Disaster

On January 17, 1994 an earthquake struck Reseda, CA at 4:31am local time. The earthquake was named the "Northridge Earthquake" because it was originally believed to have occurred in the Northridge suburb of Los Angeles. The rupture lasted approximately 8 seconds, but as it was on a blind thrust fault the seismic waves were amplified and felt for 20-30 seconds in some areas.[3] The earthquake was felt as far away as Las Vegas, NV, which is nearly 300 miles away, and at the time was the most expensive seismic disaster ever recorded in the United States with damages estimated at over $20 billion.[2]

Several reports state there were advantages to the timing of this disaster. Since the earthquake occurred early in the morning and on a holiday, there was little traffic on the road as most people were at home. Many vulnerable and high occupancy structures were vacant and parks and recreation facilities, which were soon to become shelters, were empty. [4] Further, law enforcement was able to strategically where to position officers to prevent any civil disobedience.[5]

The earthquake left the infrastructure of the area seriously damaged – power, water and communications were disrupted for extended periods of times. This was the first time in history that a single event caused a total electrical system blackout over the entire City of Los Angeles.[6] Fortunately, power was restored for

[2] *Historic Earthquakes: Northridge, California*. USGS. Accessed online on December 26, 2011 at http://earthquake.usgs.gov/earthquakes/states/events/1994_01_17.php
[3] *1994 Northridge Earthquake.* Valdez, Luis D., American Red Cross Greater Los Angeles Region, June 2011, pg. 7
[4] *Northridge Earthquake Interim Report*. State of California. April 1994, pg. 2
[5] *City of Los Angeles Northridge Earthquake After-Action Report.* City of Los Angeles. June 1994, pg. 8
[6] *Ibid.*

93% of the city within 24 hours, and within nine days almost all the city had power. Approximately 100,000 homes and business were left without potable water after the earthquake and most had it restored in less than a week. Gas lines and telecommunication services were the fastest to come back on line. Major freeways were also impacted. Several major freeway interchanges collapsed, resulting in areas being cut off from one another.

Sheltering organizations had opened 23 congregate shelters by 9:00am on January 18 with 3,600 evacuees provided support in one night and 6,000 meals served.[3] By the end of the second night, peak demand for shelter space was over 20,000 people and exceeded shelter capacity by approximately 13,000.[7] On January 20, demand for shelter space still exceeded capacity by about 4,000. It was not until January 21 that shelter capacity exceeded the demand. As a rainstorm approached a few days after the earthquake, the mayor directed that tents be placed at selected park locations. These open space shelters had 24-hour security presence provided by the National Guard. By January 23, the City of Los Angeles had 44 shelters in operation serving approximately 14,000 evacuees.

While the number of open shelters peaked on January 24, the total shelter population peaked in early February. By February 6 all shelters except one were closed.[8] The last of shelters closed on February 21, five weeks after the earthquake.[4] It should also be noted, however, that the City of Los Angeles extended their cold-weather shelter program for an additional 30 to 40 days and extended the maximum people allowed to be sheltered in this program.[9]

The Red Cross, Salvation Army, and National Guard ran the congregate shelters. The Red Cross managed the NTS operations at all city parks and recreation facilities and the city provided portable toilets, janitorial services, and security. The City of Los Angeles Police Department provided security for shelters for more than two weeks after the event.[10] Meals were provided to evacuees at 164 shelter locations in Los Angeles and Ventura counties by a variety of agencies.[4] By the end of the third week, 1.3 million meals had been provided to evacuees.

More than 20,000 people self-evacuated to parks and schoolyards near their homes.[11] However, due to the number of aftershocks and because of a history of building failures in their native countries, many evacuees refused to return home

[7] *Ibid.*
[8] *1994 Northridge Earthquake*, Valez, Luis D., American Red Cross Greater Los Angeles Region, June 2011, pg. 20 The City of Los Angeles states in their after-action report this was done by February 19 (pg. 16).
[9] *The Recovery and Reconstruction Plan of the City of Los Angeles: Evaluation of Its Use after the Northridge Earthquake*, August 1997, Appendix A. Spangle Associates with Robert Olson Associates, Inc.
[10] Ibid.
[11] Many documents from credible sources state different statistics on the number of evacuees staying in tents, however, the most commonly cited statistic is 20,000 people.

even though their buildings had been inspected and determined to be safe.[5] The City of Los Angeles used Reassurance Teams comprised of city personnel, clergy, and mental health professionals to talk with evacuees to get them to move back to their homes.

The City of Los Angeles Department of Recreation and Parks decided that the priority was to move evacuees out of tents and into buildings.[9] So, limited services were provided in open space shelters. As an example, medical clinics were not allowed to operate in parks. Also, there was some pressure to return schools to normal operations, so sheltering at these sites was consolidated into parks and recreation sites which further consolidated to fewer locations as evacuee numbers decreased.

Key Observations

Dominant Themes

Donations & Volunteer Management
The coordination of volunteers by the City of Los Angeles was successful after this disaster as a volunteer management plan was already in place.

Logistical Support/Dock Management
Several reports cite the need for housing for responding personnel. In some situations, personnel were unable to return to their homes outside the impact area and required shelter.

In the first days after the disaster, shelters lacked some resources. As an example, one shelter lacked health care supplies and relied on the support of a local community group. For several of the responding personnel, this highlighted the need for more community partnerships. This key observation has been applied to response plans which has improved coordinated disaster relief services.

Public Health, Medical and Mental Health Services
Multiple agencies commented they had insufficient staff to handle the mental health needs of the responders and evacuees after this event. It is clear that there is a need to have additional health professionals available to respond to support both staff and evacuees.

Staffing
There was a general lack of staff, in particular nurses, to support relief efforts. While FEMA was able to supply 500 nurses, the first group did not arrive until 8 days after the event. Due to this delay, many medical needs at the shelters had already been addressed. Staff shortages resulted in long shifts, denied days off and no flextime and may have contributed to exhaustion, concentration problems, mood swings, irritability and sleeping disorders with the staff. In addition, there was a lack of supervisors.

Additional Themes

NTS Management
There was a lack of information on the size and amenities of all the city parks and recreation facilities. One of the after-action reports recommended completing an inventory of shelter sites. Since this disaster occurred, agencies in this area have sought and improved their information availability regarding potential shelter locations.

Food Service
Food was described as inferior and did not represent good nutritional balance. Examples of what food was available to clients were sandwiches for all three meals and refried beans for three days. Since the disaster, relationships with food vendors have been expanded in order to provide faster access to meals with a better nutritional balance, as well as options to better meet cultural and dietary needs.

Local Culture
Some shelters were informed that staff members were not fully aware of the local culture and customs. Due to this, some staff members came across as rude.

Security and Building Access Control
A challenge cited in regards to security was that staff were not prepared to identify or deal with gang members. Many staff assigned to shelter did not know the neighborhoods they were located in nor were they informed about how to identify gang activity.

B. Hurricane Katrina

Quick Facts: Hurricane Katrina[12]	
Location	Landfall occurred in southeast Louisiana and most significantly impacted Louisiana and Mississippi
Date	August 29, 2005
Incident/Event Details	Hurricane Katrina initially made landfall over southern Florida as a Category 1 hurricane. When it traveled over the Gulf of Mexico it strengthened to a Category 3 hurricane and made its second landfall in southeast Louisiana
NTS Models Used (after the hurricane's second landfall)[13]	1. Mega-shelters a. Cajundome, Lafayette LA; sheltered 18,500 evacuees over 58 days; 409,000 meals served b. Reliant Park, Houston, TX; 27,100 evacuees over 37 days c. Dallas Convention Center & Reunion Arena, Dallas, TX; 25,000 evacuees over 39 days; 114,200 meals served d. Superdome, New Orleans, LA; sheltered approx. 9,000 evacuees and 550 National Guardsmen. Estimated peak population between 15,000 and 20,000 2. Open space shelters: a. City Hall, New Orleans, LA; sheltered 250 evacuees b. Waveland, MS; sheltered 65 evacuees c. I-10; sheltered 200 evacuees d. Long Beach, MS e. Pass Christian, MS; sheltered 1,000 evacuees

Overview of Disaster

Hurricane Katrina resulted in an estimated destroyed or uninhabitable an estimate 300,000 homes and more than 1 million people in need of temporary shelter.[14]

The sheltering operations after Hurricane Katrina were unique in that shelters were opened outside the affected area and across the country. This case study focuses on the Non-Traditional Shelters opened at Reliant Park and in the Astrodome in Houston, TX.

[12] *Tropical Cyclone Report*: *Hurricane Katrina*. National Hurricane Center. Accessed online on December 22, 2011 at http://www.nhc.noaa.gov/pdf/TCR-AL122005_Katrina.pdf
[13] *Mass Care Guidance for Emergency Planners.* For more information contact the Los Angeles Operational Area.
[14] *National Disaster Housing Strategy*. FEMA. Accessed online on December 27, 2011 at http://www.fema.gov/pdf/emergency/disasterhousing/NDHS-core.pdf

The Astrodome was the first NTS to be opened. Before evacuees arrived, a Unified Command was established, a table of organization was developed, and arrangements for meals were made. Fortunately, the on-site catering company offered to provide the meals for the entire operation at cost. The Astrodome received its first evacuees within 24 hours of the local government deciding to open the NTS. Within a few days the Reliant Center was also opened and that NTS also quickly filled to capacity as well. The total population at both Reliant Park sites (Astrodome and Reliant Center) peaked at about 27,000 evacuees. [13]

A full array of services, which are not usually found in traditional congregate shelters, was provided to support the evacuees. These services included postal services, job placement, banking, and pharmacy services. The Department of Education also gathered the number and ages of the children in the NTS to determine where there was classroom space to place them. The department also provided a bus service to get the children to and from school.

A field hospital, multiple on-site clinics, and a shuttle system to move people between the medical areas were established at the Astrodome. The on-site health care services also provided dialysis, an OB-GYN clinic, and isolation for those that came down with the Norwalk virus.

To facilitate communication amongst the evacuees and family reunification, a wall, paper, and pens and pencils were provided for leaving messages at the Reliant Park shelters. However, the reunification of separated families was challenging as only evacuees who were sheltering at the site were allowed access to the location.

Key Observations

Dominant Themes

Family Reunification
Due to the magnitude of the disaster and the number of locations evacuees were sent to, family reunification was a large need and a significant challenge. This was exasperated at the Reliant Park Non-Traditional Shelters as only evacuees staying at the locations were allowed access to the site.

Public Health, Medical and Mental Health Services
This was by far the most common challenge cited in this operation. One interviewee described the medical needs as “out of this world.”

The Non-Traditional Shelters needed staff who could support people with disabilities and others with access and functional needs as well as provide clinic and hospital services. Some evacuees arrived in Houston in hospital gowns with health needs including dialysis, blood transfusions, detox, or diabetes/insulin injections.

One challenge was that evacuees from a tuberculosis clinic walked around the general population at the Reliant Park locations but refused to take their medication. Also, the need to have a way to assign evacuees to numbered cots was recognized as the shelter management team knew who was staying in the dormitory areas but had no way to quickly find individual evacuees.

Private Sector Coordination
One of the most common themes to come out of the Hurricane Katrina response was the need for increased planning pre-incident/event. The coming together of local government agencies, community organizations, and the private sector to get to know one another is invaluable.

One positive aspect of the operations at the Reliant Park Non-Traditional Shelters was that, in the words of one interviewee, the City of Houston was "100% invested" and "resourced it the best they could." Also, the City established a Unified Command structure, which included representatives from the city, county and Coast Guard, an organization structure was developed before evacuees arrived, and staff knew whom their supervisor was and how to get resources.

Security and Building Access Control
Ensuring the safety of evacuees during NTS operations can be challenging. Securing the perimeter and controlling access to individuals who need to be in an NTS can also be difficult. Part of this challenge includes limiting access to the NTS to people who want to take advantage of the NTS population.

Police resources were stretched to meet the security needs at the Reliant Park location. So, spontaneous volunteers who wore matching t-shirts were assigned to support community relations and to wander through the locations to monitor conditions and provide information to evacuees. The situational awareness these volunteers provided helped crime prevention efforts and vector control.

Assisting evacuees to replace lost or missing photo IDs highlighted the need for a solid plan for these types of situations in order to maintain security to and within the shelter and support evacuees returning to normalcy.

Additional Themes

NTS Management
There was a need to conduct contingency planning for the Non-Traditional shelters (e.g., evacuation planning). Also, the importance of working with the local fire marshal was emphasized to ensure that each NTS is in compliance with the fire code.

The involvement of the facility management/owners proved to be a key to success in the response. At the Reliant Park facilities the management team had the full involvement of the owners and they were viewed as true partners.

Another key observation was that mega-shelters had limits on how long they could be used as an NTS. The cities and the buildings' management/owners pushed for the facilities to be vacated due to the lost revenue and to get the community back to "normal" as soon as possible.

Logistics Support/Dock Management
At the Reliant Park Non-Traditional Shelters, there was some confusion in working with city protocols for logistics support as the process was new to many response staff.

C. California Wildfires

Quick Facts: California Wildfires	
Location	Southern California
Date	October 2007
Incident/Event Details	Concurrent wildfires in various locations (Santa Barbara County to U.S.-Mexico border); most significant activity threated the City of San Diego
NTS Models Used	1. Evacuees sheltering in tents on their property were supported by CBOs 2. Open space shelters opened in Dulzura and the Naval Amphibious Base Coronado 3. Mega-shelter opened at Qualcomm Stadium and other evacuees stayed in their own campers in the parking lot

Overview of Disaster

The 2007 California Wildfires began on October 21, 2007 during a Santa Ana wind event that lasted for three days. Santa Ana winds are characterized by warm temperatures, low relative humidity, and increased wind speeds; as they travel through the mountain passes they can approach hurricane force. The combination of wind, heat and dryness turns trees into explosive fuel.

Fires burned from Santa Barbara County to the U.S.-Mexico border with some of the most significant activity occurring in San Diego County. At the peak of this disaster, 17 larger fires and dozens of smaller ones were burning throughout the region with seven separate fires simultaneously burning in San Diego County. [15] Over the course of the first two days of the event, more than 200,000 residents in the fire's path in San Diego County were successfully evacuated. Every citizen in the City of San Diego, America's eighth largest city, was impacted by this disaster in some way. For the first time in San Diego County, a hospital was evacuated. In total, approximately 900,000 people were displaced throughout Southern California and the event was therefore the largest evacuation in California's history.[15]

More than 54 congregate shelters[16] were open across southern California; however, it became clear as the fires grew that these sites would be insufficient

[15] *California Fire Siege 2007: An Overview*. California Department of Forestry and Fire Protection, Governor's Office of Emergency Services, and the U.S. Department of Agriculture. Accessed online on December 26, 2011 at http://www.fire.ca.gov/fire_protection/downloads/siege/2007/Overview_CompleteFinal.pdf

[16] *Qualcomm Stadium Mega-Shelter Guide TTX – September 2010*. Becker Disaster Recovery, Inc.

to shelter all the evacuees in San Diego County. City of San Diego officials recognized the need for a shelter that could hold thousands of people and, due to the unpredictable paths of the fires, in a location sufficiently out of harm's way. In the early hours of October 22, the City decided to open Qualcomm Stadium as a Non-Traditional Shelter. As the Red Cross was already operating more than a dozen shelters in the area, City officials chose to open and staff the NTS with city resources until the Red Cross could provide support. In addition to the anticipated 100,000 evacuees from the general population, hundreds of nursing home patients from 11 facilities were relocated to the NTS. Also, thousands of evacuees, many of whom had medical conditions, sheltered in the stadium and parking lot.

The Red Cross also activated an agreement to open an NTS at the National Orange Show Fairgrounds in San Bernardino County.[17] More than 3,000 evacuees stayed at this open space NTS, either inside or in their own tents and campers in the parking lot.

In addition to the 54 traditional congregate shelters and two Non-Traditional Shelters provided in San Diego County, several open space Non-Traditional shelters were spontaneously set up.[18]

According to the City of San Diego After Action Report, many of the evacuees were able to return to their homes by October 24, with some returning as early as October 23. By noon October 26, all of the evacuees and their animals from Qualcomm Stadium had either returned to their homes, found alternate living arrangements, or were transported to the Del Mar Fair Grounds County Sheltering Facility.[19] By the time the fires were fully contained, more than 3,000 homes and other structures had been destroyed throughout Southern California. This included 369 homes destroyed in San Diego County.[15]

[17] *2007-2008 Annual Report.* American Red Cross Inland Empire Chapter. Accessed online on December 27, 2011 at http://www.ie-redcross.org/pdf/2.4_Annual_Report.pdf
[18] *2007 Southern California Wildfires After Action/Corrective Action Report.* State of California.
[19] *After Action Report – October 2007 Wildfires City of San Diego Response*. City of San Diego. Accessed online on December 26, 2011 at http://www.sandiego.gov/mayor/pdf/fireafteraction.pdf

Key Observations

Dominant Themes

Private Sector Coordination
As a result of Red Cross resources already engaged in sheltering operations at the time the Qualcomm Stadium was activated, the City of San Diego opened the NTS without the support of the organization. While the Red Cross did, in time, provide support to the NTS, it would have been beneficial to have the Red Cross involved from the very beginning because of its vast experience in Mass Care. Since this disaster occurred, plans and exercises have been conducted that involve the use of the stadium. The current plan (as of December 2011) involves the City opening and staffing the NTS for the first three days after an incident/event at which time the Red Cross will assume management it.

Health and Medical Services and Mental Health Services
While both the Qualcomm Stadium's and the National Orange Show Fairgrounds' relief operations experienced challenges providing health services to evacuees, the health related issues varied between the two sites.

With more than 500 skilled nursing facility/assisted living patients and countless other self-evacuees with medical issueus evacuated to the Qualcomm Stadium, a medical area was established at the NTS.[19] The Health and Medical group provided a variety of services that included a pharmacy and areas for triage/acute care, diabetes care, respiratory therapy, and pediatrics care. Using the Club level at the stadium allowed health care providers to have private areas, space for beds, adequate restrooms, and climate control. The need to have representatives from the community of people with disabilities and others with access and functional needs on the NTS management team became apparent.

The National Orange Show Fairgrounds in San Bernardino was open longer than Qualcomm Stadium, and thus had to provide additional long-term vector control as well as disease and contamination surveillance. To address this, the NTS management had two organizations that provided volunteers to scrub every surface in the shelter in 12-hour cycles.

Security and Building Access Control
A challenge at both the Qualcomm Stadium and National Orange Show Fairgrounds was establishing and maintaining site security. Both locations had evacuees staying in the parking lot and using some services at the sites. Providing security in the parking lot was considered more challenging due to the open space having less controlled structure and access than the facility.

The Qualcomm Stadium initially lacked a registration process, which reduced safety and security. The City eventually developed its own registration process.

A common challenge in any disaster response is providing support and services to undocumented populations. These groups usually have a fear of being

arrested by a government entity if they seek services at a shelter. At Qualcomm Stadium, an incident occurred that led to some undocumented evacuees being turned over to the Border Patrol. Because of this incident, additional families left the NTS over concerns about their immigration status.

At the National Orange Show Fairgrounds, the local police department's anti-gang squad maintained a strong police presence. Officers routinely monitored the NTS for signs of gang activity, which increased the safety of the NTS and the evacuees feeling of safety.

The National Orange Show Fairgrounds also experienced success in using wristbands to identify who should be coming into the NTS.

Additional Themes

Donations & Volunteer Management
The Qualcomm Stadium was overwhelmed with donated goods and the volume of materials and the traffic these donations generated caused significant traffic control issues around the area. An off-site supply hub was established to manage these goods and provide the supplies to shelters and command posts throughout the county.

NTS Management
At the Qualcomm Stadium a central access point created a bottleneck in accessing the NTS. It would have been beneficial to have a thorough layout of the NTS, including multiple access points to ease congestion. This may have helped prevent the need to relocate services within the NTS.

At the Qualcomm Stadium pets were not separated from their owners in the NTS. Some evacuees did not welcome having the animals in such close proximity to them. It was recommended that animal owners staying inside the NTS should have a separate area where they can stay with their pet and have animal provisions nearby. One recommended assumption presented at the 2008 Mega-shelters – Lessons Learned, Challenges and The Future Conference hosted by the Nevada Statewide Evacuation, Mass Care, and Sheltering Initiative was that 60% of people seek shelter will have accompanying animals.[20]

Recovery Information and Resident Information
There was a significant lack of translators available to help share information with the evacuees at the Qualcomm Stadium. Suggestions for how to improve communication with evacuees includes providing information such as a general map of the NTS, public transit maps and schedules, and a listing of frequently asked questions.

[20] *Pets in Disasters* - presented by Dan DeSousa at the Mega-shelters – Lessons Learned, Challenges and The Future Conference hosted by the Nevada Statewide Evacuation, Mass Care, and Sheltering Initiative, April 29, 2008.

D. Hurricane Ike

Quick Facts: Hurricane Ike[12]	
Location	U.S landfall occurred in Galveston, TX
Date	September 13, 2008
Incident/Event Details	Hurricane Ike made landfall as a strong Category 2 hurricane
NTS Models Used	1. Mega-shelter in Houston, TX 2. Open space shelters opened in Lufkin, TX and on Galveston Island, TX

Overview of Disaster

On September 13, 2008, after causing catastrophic damage in Cuba, Hurricane Ike made landfall in Galveston, Texas. The hurricane impacted several states and Canada as it traveled east towards the Atlantic Ocean.

Hurricane Ike's 13 foot storm surge swept across Galveston Island and on the mainland the hurricane made landfall with sustained winds near 110 mph.[21] The storm system also spawned several tornadoes and brought high winds, heavy rainfall, and flooding to parts of Texas, Ohio, Kentucky Oklahoma, Arkansas, Illinois, Indiana, Iowa, Missouri, and Michigan.

Hurricane Ike's effects were felt throughout Texas and resulted in both mandatory and voluntary evacuations. A widespread power outage occurred and about 5 million people were without power across the state.[22] The hurricane led to the largest evacuation of Texas and the largest search and rescue operation in history. The hurricane was also the third most expensive disaster in FEMA history, behind Katrina and Andrew. [23] Estimated housing losses in Texas due to the hurricane were more than 8,000 units.[24] The damage caused by Hurricane Ike made it the second costliest Atlantic hurricane of all time, only surpassed by Hurricane Katrina.[25] Of not is that this hurricane came just days after Hurricane Gustav had caused significant damage on the Gulf Coast from Texas to Florida; some of the same areas were impacted by both hurricanes.

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[21] *Hurricane Season 2008: Hurricane Ike (Atlantic Ocean), Hurricanes/Tropical Cyclones*. National Aeronautical and Space Administration. Accessed online on December 26, 2011 at http://www.nasa.gov/mission_pages/hurricanes/archives/2008/h2008_ike.html
[22] *National Weather Service Post-Event Situation Report on Hurricane Ike*, September 14, 2008. National Weather Service.
[23] *Hurricane Ike Fast Facts*. The City of Houston. Accessed online on December 27, 2011 at http://www.houstonhurricanerecovery.org/node/163
[24] *Hurricane Ike, Impact Report – December 2008.* FEMA. Accessed online on December 26, 2011 at http://www.fema.gov/pdf/hazard/hurricane/2008/ike/impact_report.pdf
[25] *Hurricane Ike (1-15 September 2008) and Hurricane Categories.* Laske, Gabi. Accessed online on December 27, 2011 at http://quakeinfo.ucsd.edu/~gabi/sio15/case-studies/hurricane-ike.html

The counties of Harris, Galveston, Chambers, Orange and Jefferson were the most affected by Hurricane Ike; this includes Galveston Island (in Galveston County) and Houston (in Harris County). This document focuses on the impact of Hurricane Ike on Galveston Island and Houston and specifically the NTS operations at these locations.

Some of worst damage from the storm occurred on Galveston Island and in the City of Galveston. The storm tide that washed over much of the island caused severe structural damage to at least 1,500 homes.[22] Relief efforts on the island were hampered due to a lack of a water service, communications, electrical service, fuel, ice, lodging for staff and other property available for housing. In addition to the lack of these resources, Galveston Island also suffered from a lack of available facilities for congregate sheltering.[26]

Even though a new convention center had been built on the island, the local government chose not to use this site as a shelter due to a concern that it would not provide sufficient protection if another hurricane impacted the area. A private contractor was engaged on September 25th to set up a congregate shelter, which was fully functioning by September 27th; however, due to issues with the implementation of contracting agreements, confusion occurred regarding reimbursement.

Despite the challenges, Galveston Island was reopened to residents on September 20, 2008. A private contractor was engaged on September 25, 2008 to set up an open space shelter on Galveston Island and the NTS was fully functioning by September 27, 2008.

In Houston, many congregate shelters were set up throughout the community. The City of Houston also recognized the need to open a mega-shelter in addition to the traditional shelters already opened. The mega-shelter was set up in a large vacant retail property within about 48 hours from the decision to open it. This NTS was managed under a Unified Command structure, with the Red Cross taking a larger role in the management than the organization had in the past in previous mega-shelter operations in Houston. All of the infrastructure and resources needed to support the NTS had to be brought in and included a kitchen, portable toilets, showers and heating, ventilation, and air conditioning (HVAC). A variety of state and city agencies came on site to provide recovery services.

Throughout the disaster relief efforts, the Red Cross supported 241 evacuee shelters providing over 157,000 overnight stays.[27] Other community-based organizations operated an additional 150 shelters throughout the area, bringing

[26] *American Red Cross Galveston Island Non-Traditional Case Study*, pg. 4. Asset Group Inc.
[27] *DR 238-09 TX Hurricane Ike Service Delivery Plan.* American Red Cross.

the total to almost 400 shelters.[28] Peak shelter population reached 32,856 on September 13, 2008.

Key Observations

Dominant Themes

NTS Management
No buildings were available to provide shelter on Galveston Island, so FEMA built a base camp to support responding disaster staff. Other response agencies set up an open space NTS for evacuees. However, there was still a challenge in helping the local community overcome their reluctance in sheltering in an open space environment.

The City of Houston set up a Unified Command structure, with the Red Cross taking a leadership role, to manage the NTS operation.

Private Sector Coordination
Multiple sources stated that there was a challenge in having the proper entities authorize the contracted NTS that was set up on Galveston Island. This resulted in confusion and issues regarding reimbursement.

Key observations from the Hurricane Katrina response were applied to Hurricane Ike operations. Houston opened a mega-shelter during Hurricane Katrina and this experience was credited with helping the high level of coordination in the NTS that occurred after Hurricane Kike. Another key observation from Hurricane Katrina was the need to coordinate and work with a variety of response organizations and community groups. For example, some NGOs and advocacy groups, such as the National Association for the Advancement of Colored People (NAACP), requested additional services for the populations they represented. This reinforced a key observation from the Hurricane Katrina response, which was to display cultural sensitivity for the disaster-affected population.

Additional Themes

Public Health, Medical, and Mental Health Services
Due to the significant damage on Galveston Island, the health care system was severely impacted and health and medical support services. Acute care needs were transported off of the Island.

In Houston, a larger than expected number of people with disabilities and others with access and functional needs required support. Many people who had pre-disaster health and socio-economic challenges would have traditionally stayed in the impacted area due to a lack of resources to evacuate. Instead, they were evacuated pre-landfall. This was due to the key observation in providing

[28] *Chronology for DR 238-09 Hurricane Ike Texas.* American Red Cross. October 29, 2008.

transportation after Hurricane Katrina. As more evacuees arrived at the NTS than usual, due to the provision of transportation, health care support at the NTS was stretched.

Security and Building Access Control
Security was a challenge at the Galveston NTS. Although officials recognized that perimeter security was needed, there was concern that fencing the NTS in would create the perception that it looked and felt like a refugee camp. The lack of fencing created challenges in tracking evacuees and monitoring access control.

E. American Samoa Earthquake & Tsunami

Quick Facts: American Samoa Earthquake and Tsunami[29]	
Location	Samoan Islands
Date	September 29, 2009
Time	6:48am local time
Incident/Event Details	Magnitude 8.1 earthquake and tsunami
NTS Model Used	1. Individual tents distributed, through a partnership with FEMA, the Red Cross, and the National Guard, to families to enable them to remain on their property 2. Open space shelter operated by the Red Cross for the organization's response staff (about 60 people).

Overview of Disaster

The Samoan Archipelago is a remote chain of 13 islands and two atolls located south of the equator near the International Date Line.[30] The territory is divided into two political entities, the US Territory of American Samoa and the neighboring country of Samoa. American Samoa covers 76 square miles and includes five volcanic islands and two atolls.[31] The total territory encompasses 117,500 square miles, which is about the size of the state of Oregon, when marine waters out to 200 miles are included.[32] The population is approximately

[29] *Magnitude 8.1 Samoa Islands Region*. USGS. Accessed online on December 22, 2011 at http://earthquake.usgs.gov/earthquakes/recenteqsww/Quakes/us2009mdbi.php
[30] *History*. American Samoa Tourism. Accessed online on December 26, 2011 at http://www.amsamoatourism.com/history.htm
[31] *American Samoa*. Fagatele Bay National Marine Sanctuary. Accessed online on December 22, 2011 at http://fagatelebay.noaa.gov/html/samoa.html
[32] *Explore Our Islands.* American Samoa Visitors Bureau. Accessed online on December 22, 2011 at http://www.americansamoa.travel/explore1

67,000 and grows a little more than 1% per year.[33] About 95% of the population lives on Tutuila Island.[30]

On September 29, 2009 a magnitude 8.1 earthquake struck southwest of the Samoan Islands at 6:48am local time. This quake generated tsunami waves that struck the main island of Tutuila with the first wave hitting at about 7:08am. The area continued to experience aftershocks for months after the event.

After experiencing the earthquake, many residents began moving to higher ground fearing a tsunami had been generated.[34] More than 30 people were killed and hundreds were injured in this disaster, primarily by the tsunami.[35] Critical infrastructure and public facilities were severely impacted by this event. One of two power plants on the island was severely damaged resulting in wide spread power outages.[36] Residents were advised to boil water for drinking and cooking.

With the widespread destruction on the island, many people lost their homes and places of business. Immediate needs included housing, durable medical equipment, and mental health counseling. The American Samoa Government, which has the responsibility for providing shelter on the island, made shelters and food available in response to the event. The American Red Cross (Red Cross) assisted the government in providing some meals for the shelters. The faith-based community also opened shelters; delivered food and water; provided durable medical equipment; and took part in bulk distribution efforts.

Relief efforts focused on allowing people to be as self-sufficient as possible and reducing the need for sheltering. In this disaster, bringing the resources to the people was considered more effective than bringing the people to the resources. Housing was provided primarily through the distribution of individual tents for the disaster-affected population to use on their own property. FEMA, the Red Cross, and the National Guard collaborated to acquire and distribute supplies to the disaster-affected population. FEMA provided short term housing kits and over 1,300 tents were distributed to families.[37] The Red Cross provided coolers, comfort kits, cots, work gloves, hammers and flashlights to the families. The Red Cross also distributed food and other bulk distribution items, serving nearly 2,000

[33] *The World Factbook.* Central Intelligence Agency. Accessed online on December 22, 2011 at https://www.cia.gov/library/publications/the-world-factbook/geos/aq.html
[34] *Residents Head Inland to Higher Ground for Safety.* Mata'afa, Tina, Samoa News, September 30, 2009
[35] *The American Samoa Earthquake, Tsunami, and Flooding (FEMA-1859-DR) Joint Field Office After Action Report/Improvement Plan.* Federal Emergency Management Agency. Draft February 22, 2010, pg. 2
[36] *FEMA and ASPA "Throw the Switch" at the Satala Power Plant*. FEMA. Accessed online on December 27, 2011 at http://www.fema.gov/news/newsrelease.fema?id=50021
[37] *Disaster Assistance in American Samoa Tops $33 Million*. Federal Emergency Management Agency. Accessed online on December 27, 2011 at http://www.fema.gov/news/newsrelease.fema?id=50627. March 17, 2010

families.[38] The Red Cross and the National Guard worked together to distribute all of these supplies and Red Cross staff helped families set up their tents.

The Red Cross operated an open space shelter for the organization's relief operations staff and this presented several challenges including limited showering and toilet facilities, pest/vector control, limited personal communications access, and perceptions of inequality among staff.

Key Observations

Dominant Themes

Distribution of Goods
One highlighted challenge was cultural differences, which impeded the distribution of assistance items. In the local culture it is common for the chief or another leader to say which families need service. However, this conflicts with the ideal of providing services without discrimination to all who are in need. To help address this, the Red Cross teamed up with the local National Guard to distribute supplies in the villages. This uniformed National Guard presence with local guard soldiers lent additional credibility to the operation.

The family tents initially brought in by FEMA were not suited to the high wind environment in American Samoa, so new tents had to be purchased and brought in that were better suited to the local weather conditions. Of note is that while FEMA assisted families with home replacement, the families were required to stay in these tents for several months.

Local Customs & Culture
Cultural awareness training was provided to personnel responding as part of the Joint Field Office (JFO) and several sources cited this as a success of the relief operation. However, there were still challenges in working within the local culture during the bulk distribution efforts.

The families in American Samoa tend to be large (12+ people), which needed to be factored in when determining the quantity of goods the average family needed. Many were given two or three family kits. Also, the Samoan people tend to be physically larger than the average American and in some cases one person had trouble fitting in a six-person tent.

Logistical Support/Dock Management
The most commonly cited challenge with this relief operation was logistical support. The extremely remote location made getting both staff and supplies to the island a challenge. Also, shipments arriving on military flights often got

[38] *A Look Back: the American Samoa Tsunami*. American Red Cross. Accessed online on December 27, 2011 at http://www.redcross.org/portal/site/en/menuitem.1a019a978f421296e81ec89e43181aa0/?vgnextoid=f601f6909b95b210VgnVCM10000089f0870aRCRD, September 29, 2010

delayed and the tracking of shipments was difficult. Even though relief agencies usually prefer to procure supplies from within the country they're providing support to, the closest resources in this operation were located in New Zealand. As such, a repeated recommendation was that relationships with vendors and organizations in New Zealand be established as this country is the closest major commercial center to the islands.

Multiple agencies based in the continental United States sent personnel to American Samoa. This overwhelmed the local community resources in terms of available lodging and rental cars.

Staffing

Following the operation, the Red Cross surveyed the staff that supported it. [39] In these surveys, staff members commented that only one shower and two toilets were provided for the 60+ staff members; and mosquitos and fleas were a constant problem in this environment. Staff members purchased their own nets and bug spray even though they felt these resources should have been provided for them by the relief operation. In addition, common practices on relief operations such as providing food at or near the NTS and telephones with which to call home were not provided. General staff also showed concern that while they slept in an open space environment, leadership staff had dormitory rooms in a hard-sided structure. Only 27.5% of the staff agreed that their lodging was safe, secure, and sanitary. The majority of staff felt that while evacuees' needs were met on this operation, their needs were not.

Sleeping and working conditions were also difficult due to the extreme heat and humidity. This resulted in a reduced quality of sleep for many staff, which may have impacted their effectiveness.

Key observations can be drawn from the staff shelter experience that can be applied to planning for shelters serving a disaster-affected population. Everyone, regardless of whether they are an evacuee or staff member, expects their basic needs to be met at a congregate shelter. It was clear from the staff surveys and interviews conducted that the staff did not feel this happened at their shelter.

Overarching Observations

In addition to the key observations, several general themes emerged from the case studies. These overarching observations are noted below. Again, while some observations could be placed under multiple categories of themes, they were grouped under the most dominant.

Customer Service

One challenge was that some disaster response volunteers, who were working in long-term shelters, began to lose their "customer services skills". Some

[39] *DR#560-10 ARC Staff Survey Results.*

supervisors noted their staff wanted to run an NTS more like a corrections facility where strict rules are imposed on the population.

There was also a constant need to manage expectation with the NTS evacuees. NTS staff needed to communicate the reality of the situation to evacuees and not make commitments they could not fulfill.

Dormitory Management
The need for physical barriers to separate dormitory areas of single men, single women and families was repeatedly cited as a need. Also, the longer an NTS remains open, the more the need for privacy grows. However, it was also acknowledged that this need for privacy has to be balanced with the need for overall safety and security.

NTS Management
The need for tents is often the 500lb gorilla in the room in any discussion about open space shelters. Many communities are apprehensive to consider this option because of potential political ramifications. One concern of some jurisdictions is that they do not like the image of having their evacuees placed in tents. However, the viability of open space Non-Traditional Shelters should be addressed in any planning phase.

Family Reunification
The need for Family Reunification services, especially after large disasters, was cited a few times.

Logistics Support/Dock Management
Thoughts like “Operating an NTS is like operating a city” were echoed through the interviews. NTS operations are not like traditional congregate shelter operations that many agencies are used to.

The enormity of the logistical support needed for an NTS can easily overwhelm any one agency. Toilets, showers, medical supplies and food, for example, all become immediate needs after a disaster. Interviewees cited having an adequate number of toilets, as well as means of emptying portable toilets, was a consistent challenge.

Long term needs have to be considered from the beginning of NTS operations. Thoughts echoed by the interviewees included: How are children going to get to school? Where are children going to study in the NTS? How do people get to their jobs?

The limiting factors in supporting an NTS often boil down to facilities, staff, and logistical support. One consideration is if it is easier to bring the infrastructure to the evacuees or bring the evacuees to the infrastructure. This will depend on a variety of factors including the severity of the damage, the climate, and location.

Planning
Communities are sometimes hesitant to discuss NTS planning. Reasons why include an apprehension to commit resources, concerns about impacting everyday life, and concerns for the local economy. When a convention center and sports arena is used as an NTS, the operation often impacts the local community when an event or a show has to be cancelled.

However, interviewees repeatedly discussed the importance of planning discussions that should occur during the preparedness phase. In nearly every event either planning was cited as a success or the lack of planning was cited as a challenge. Interviewees stressed that the time to get to know other responding agencies, including government agencies, NGOs, and private sector groups, is during the planning stage and not after the disaster has occurred.

Some aspects to consider in the planning phase include floor plans of an NTS, security, food, and involvement of NGOs. NTS management should also reach out to event planner to recruit volunteers to help with the site's management. Also, discussions need to be conducted with the private sector groups to determine if they'll really be able to provide support after a catastrophic disaster.

Public Health, Medical and Mental Health Services
Many evacuees in the shelters looked at here had challenges before the disaster occurred and brought those challenges with them to the shelter. Multiple shelters looked at here had to deal with substance abuse, domestic violence, and mental health illnesses.

Security and Building Access Control
One repeated concern was the need to protect evacuees from opportunists. Interviewees repeatedly brought up the need for an NTS to have adequate access control.

Evacuees will go to locations they think are safe, whether this is true or not. This occurs frequently after earthquakes when evacuees are concerned about the structural integrity of buildings, despite them being inspected and declared safe for occupancy. Regardless of the location, these concerns present additional challenges for the agencies that are trying to assist the disaster-affected population.

A portion of the evacuees that stay in an NTS long term will have pre-disaster health and/or economic issues that need to be dealt with at the NTS. At several Non-Traditional Shelters referenced in this document, NTS staff had to provide support to people with substance abuse problems.

Weapons at a shelter were also a challenge cited by interviewees. While the Red Cross has a policy of no weapons in the shelter, some evacuees will continue to

bring them into an NTS. Concerns were also raised about what to do with weapons when they are found.

Several of these NTS operations used volunteers to patrol the NTS as a Community Relations function to increase the sense of safety in the shelter. Well-identified volunteers would walk through the NTS not only to provide a presence, but also to gather information and to help identify potential problems. This has been cited also as a success in helping with vector control as these individuals could spot simple problems like open food being kept under cots.

Multiple NTS operations cited the success in using wristbands to easily identify returning evacuees. However, one downside of using wristbands is that evacuees were also identifiable as being a shelter resident when they went into the community. However, it appeared the benefits outweighed the costs.

ADDITIONAL LIMITED CASE STUDIES

In addition to the Non-Traditional Shelters opened after the five disasters discussed above, Non-Traditional Shelters were opened after the Whittier Narrows and Loma Prieta earthquakes and the North Dakota flooding. While these incidents/events were not expanded to full case studies at the time the others were completed, a limited case study was done on each of them. Quick facts and observations from these NTS operations are detailed below.

F. Whittier Narrows Earthquake

Quick Facts: Whittier Narrows Earthquake[40]	
Location	Epicenter located in Rosemead, CA
Date	October 1, 1987
Time	7:42am local time
Incident/Event Details	Magnitude 5.9 earthquake; three days later on October 4 a 5.6 aftershock struck.
NTS Model Used	1. Spontaneous open space shelters initiated by the disaster-affected population. 2. Response agencies provided support.

Overview of Disaster

While the damage from the Whittier Narrows earthquake and aftershocks was not severe, fears of additional earthquakes and doubts as to the structural integrity of buildings resulted in spontaneous open space sheltering. Some of the population chose to set up their own tents in parks and school grounds in order to remain in the open. As a result, response agencies provided support to this population. Even when buildings were inspected and found to be safe for occupancy, the City of Los Angeles still found it a challenge to reassure the sheltered population enough for them to feel safe in returning to their homes. In order to address these concerns, Assistance Teams comprised of members of the Red Cross, County Mental Health, and the City of Los Angeles Department of Building and Safety met individually with evacuees to determine their needs and to encourage them to return to homes that were structurally safe.

[40] *Historic Earthquakes: Whittier Narrows, California*. USGS. Accessed online on December 22, 2011 at http://earthquake.usgs.gov/earthquakes/states/events/1987_10_01.php

G. Loma Prieta Earthquake

Quick Facts: Loma Prieta Earthquake[41]	
Location	Epicenter located in the Santa Cruz Mountains, CA. The earthquake impacted the entire San Francisco Bay Area.
Date	October 17, 1989
Time	5:04pm local time
Incident/Event Details	Magnitude 6.9 earthquake
NTS Models Used	1. Mega-shelter at the Moscone Center in San Francisco, CA. 2. Spontaneous open space shelters initiated by the disaster-affected population.

Overview of Disaster

The City of San Francisco was significantly impacted by the Loma Prieta Earthquake and in partnership with the Red Cross opened the Moscone Center, a local convention center, as a mega-shelter. However, due to pre-existing contractual obligations which would have a significant financial impact, this NTS was forced to move its population to other locations in just 10 days. In addition, the local government sought to limit sheltering in the city to avoid potential negative economic impact.

In Watsonville, south of the San Francisco Bay, a shelter was opened; however, evacuees chose to set up their own tents to shelter instead. As a significant number of evacuees were undocumented this may have led to concerns that they could be arrested if they sought the services of the shelter. To encourage these evacuees to take shelter, the Red Cross reached out to trusted community leaders who advised the displaced population that no immigration status would be checked at the shelter.

H. North Dakota Flooding

Quick Facts: North Dakota Flooding[42]	
Location	Minot, ND
Date	June, 2011
Incident/Event Details	Flooding

[41] *October 17, 1989 Loma Prieta Earthquake*. USGS. Accessed online on December 22, 2011 at http://earthquake.usgs.gov/regional/nca/1989/
[42] Flooding Near Williston, North Dakota. NASA. Accessed online on December 22, 2011 at http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=50973

Quick Facts: North Dakota Flooding[42]	
NTS Model Used	1. Mega-shelter for an extended period of time (5 months)

Overview of Disaster

In response to the flooding in Minot, ND, an NTS was opened by the Red Cross and the City of Minot for approximately five months. This NTS is significant due to the extended length of time evacuees it remained open sheltering evacuees. While the goal is to move evacuees to temporary or permanent housing quickly after a threat has passed, in Minot, this could not happen quickly. Due in part to a pre-disaster local oil boom which had already created a housing shortage, this combined with the flood to result in a lack of immediately available temporary or permanent housing options. The displaced population, as well as disaster responders, was forced to remain in congregate shelters.

An additional challenge in the long-term sheltering environment was assisting evacuees with their pre-disaster challenges, which included substance abuse and recovery, domestic violence, and illiteracy.

KEY OBSERVATIONS

Key observations were captured through reviewing documents related to the NTS operations, included narratives, after-action reports (AAR), and evaluations. In addition, interviews were conducted with disaster relief staff that was either onsite at an NTS or part of the operational support structure.

Below is a summary of the most frequently cited key observations from the five full case studies as they relate to Non-Traditional Shelter management; health and medical services; security and building access control; local customs and culture; and private sector coordination. While several of the observations could be placed in several categories, they were listed under the most dominant theme.

NTS Management

Challenges and themes regarding management and operation of an NTS included:

- Setting up a Unified Command structure to manage the Non-Traditional Shelter is critical to ensuring high levels of coordination and organization within the NTS.
- Full involvement of the site's owner or management company is a key to success. These individuals are very knowledgeable about their site and its available resources.
- Contingency and emergency evacuation planning for an NTS by NTS leadership is essential.
- Awareness of the potential for pressure to vacate mega-shelters quickly, despite ongoing sheltering, is important. After the threat has passed, communities are eager to return to normalcy and to minimize the economic impact of the disaster. As such, there may be pressure to close the NTS before sheltered evacuees' housing needs are met.

Challenges in the use of open space shelters included:

- Tents need to be appropriate for the local environment and weather conditions; not all tents are designed for all weather conditions.
- The word "tent" can have a negative connotation, particularly for local government officials. This stigma appears to dissipate over time, but the concern may need to be addressed in planning and implementing open space shelter options.

Health and Medical Services

Health-related challenges and themes included:

- The need for health and medical services would depend on the size and scale of the incident/event and the length of time evacuees remain at the NTS; however, the service needs are generally greater at an NTS than a traditional congregate shelter. Some non-traditional shelters have included

a field hospital, pharmacy, and multiple clinics on site to meet the needs of the NTS evacuees.

- Staffing appropriate personnel to support people with disabilities and others with access and functional needs at the NTS is very important.
- It is essential that health care professionals at an NTS have access to resources, including medical supplies and a location within the NTS appropriate to meet the evacuee's health care needs.
- Having health care professionals near the entrance of an NTS providing disease surveillance is recommended. This includes monitoring of registered NTS evacuees who may have temporarily left and returned.
- Health and Medical personnel, as well as other staff, should be awareness that evacuees will arrive with a variety of pre-disaster health and medical issues which may need to be addressed.

Security and Building Access Control

Security challenges and themes included:

- Crime prevention measures are necessary to maintain the safety of the NTS. This included a uniformed and non-uniformed security presence (e.g., law enforcement, fire, military, anti-gang task force); establishing securing ingress and egress points; creating a hard perimeter if possible; and carrying out other standard community policing efforts within the NTS.
- Wristbands, applied at initial registration, are a successful tool for maintaining awareness of registered evacuees.
- Some incidents/events had challenges in serving undocumented populations due to the evacuees' fear that their legal status would be assessed. To address this, a successful technique has been to partner with local community leaders to establish trust from this population by informing them that it is safe.

Local Customs and Culture

Challenges and successes to providing support or services in a culturally sensitive manner included the following:

- Include representatives from community groups (e.g., ethnic groups, groups serving people with disabilities and others with access and functional needs) in planning efforts.
- NTS staff listening to the needs expressed by representatives of the disaster-affected and evacuee population can be helpful in understanding specific cultural needs or concerns.

Private Sector Coordination

Themes in this area included:

- The importance of pre-disaster planning cannot be overstated. Communities that had engaged in pre-disaster planning efforts were generally more effective in their response and had fewer response challenges.

- Response agencies should be aware that their presence can overwhelm smaller communities.
- Ensuring that response personnel know who is authorized by the jurisdiction to enter into financial agreements is important.

SUBJECT MATTER EXPERT INTERVIEW LIST

Below is a list of the personnel interviewed for these case studies and their current role. The vast majority of these subject matter experts either worked on or supported several of the disaster responses profiled here.

1. Abou-Samra, Omar. American National Red Cross, mass care and liaison. Hurricane Ike. Interviewed in person, December 1, 2011.
2. Bennett, Lisa. American National Red Cross, Western Region. American Samoa, Hurricane Katrina, California Wildfires. Interviewed by telephone on December 5, 2011.
3. Blake, Charles. American National Red Cross leadership. California Wildfires - San Diego, Hurricane Katrina - New Orleans, and California Earthquakes. Interviewed by telephone on December 19, 2011.
4. Bouffard, Maria. On-site leadership, Hurricane Katrina - Reliant Park, Houston, TX. Interviewed by telephone on December 2, 2011.
5. Choi, Juliet. Senior Director, Disaster Partnerships, American National Red Cross. Liaison activities. Interviewed in person on December 1, 2011.
6. Crabb, Lynn. Director, Mass Care, American National Red Cross. Mass care support. Interviewed in person on November 30, 2011.
7. Grady-Wesbecher, Lois. Director, Planning & Evaluation, American National Red Cross. Evaluation process for large disaster relief operations. Interviewed in person on December 2, 2011.
8. Hencken, Vic. Operations Management leadership, Hurricane Katrina and Hurricane Ike. Interviewed by telephone on December 2, 2011.
9. Iradi, Dan. Mass Care Management leadership, Hurricane Katrina and Hurricane Ike. Interviewed by telephone on December 2, 2011.
10. Kappert, Jon. Manager, Disaster Field Logistics Operations, American National Red Cross. Logistics for disaster relief operations. Interviewed in person on December 2, 2011.
11. Lockwood, Glenn. Operations Management leadership, Northridge Earthquake, Hurricane Katrina, and Hurricane Ike. Interviewed by telephone on December 2, 2011.
12. Luthye, Curt. Red Cross chapter leadership – San Diego. Haiti earthquake. Interviewed by telephone on November 28, 2011.
13. Mascelli, Armond. Disaster Services leadership, American National Red Cross. Interviewed in person on December 1, 2011.
14. McCorry, Becky. Disaster Services leadership, American National Red Cross. Interviewed in person on December 1, 2011.

15. McKellar, Andy. Red Cross chapter leadership – San Diego. California Wildfires. Interviewed by telephone on November 30, 2011.
16. Nanninga, Garrett. Mass Care leadership. Northridge Earthquake and Whittier Narrows Earthquake. Interviewed by telephone on December 1, 2011.
17. O'Ryon, Greg. Vice President of Readiness & Capacity Development, American National Red Cross. Red Cross disaster relief preparedness oversight. Interviewed in person on December 1, 2011.
18. Palmer, Ann. Director, Change Management, American National Red Cross. Interviewed in person on December 2, 2011.
19. Reisweber, Jim. Disaster Services Human Resources system, American National Red Cross. Hurricane Katrina leadership. Interviewed in person on December 1, 2011.
20. Reynolds, Anne. Operations Management leadership, American National Red Cross. American Samoa Earthquake and Tsunami. Interviewed by telephone on November 30, 2011.
21. Rieckenberg, Rich. Mass care leadership. American Samoa Earthquake and Tsunami, Hurricane Ike, and the California Wildfires. Interviewed by telephone on December 5, 2011.
22. Riggen, Trevor. Senior Director of Direct Services, American National Red Cross. Mass Care oversight. Interviewed in person on November 30, 2011.
23. Sandy, Doug. Mass care leadership, Northridge Earthquake, Loma Prieta Earthquake, and the American Samoa Earthquake and Tsunami. Interviewed by telephone on December 13, 2011.
24. Scholfield, Rick. Mass care leadership, American National Red Cross. Hurricane Katrina, Hurricane Ike, and the Loma Prieta Earthquake. Interviewed by telephone on November 28, 2011.
25. Zimmerman, Lauren. Operations Management leadership, North Dakota Flooding. Interviewed by telephone on December 13, 2011.

ORAL HISTORY INTERVIEW SCRIPT

Oral History Interview Questions

Please be sure to define non-traditional sheltering for the person you are interviewing; be sure they understand that we are focusing on mega and open space shelters.

1. Disaster:

2. Name:

3. Position on this disaster/how were you supporting this disaster:

4. What was your experience on the disaster we're looking at? How long were you there and during what phase?

5. Did you regularly work at an NTS site? If not, did you visit any?

6. What did the NTS look like on this disaster: What were the locations? Were they mega shelter venues, open space, or a different kind of site? How long were they open? Who initiated setting up the sites?

7. What unexpected challenges occurred during the NTS operation? How were they addressed?

8. On this disaster, what were the three greatest successes related to NTS?

9. What are the three greatest lessons learned we could take away from this disaster to apply to the next NTS situation?

10. Have you seen lessons learned related to NTS from this disaster applied to disasters that followed? If so, capture specifics.

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